

On the verified computation of solutions for parabolic initial-boundary value problems

by

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We consider a weak solution for the nonlinear parabolic initial boundary value problems. First, a formulation of a numerical verification method of solutions for the problem based on fixed point theorem and constructive error estimates for the semidiscrete approximation of a simple heat equation. Then, we describe a method to get guaranteed a posteriori estimates of the norms of inverse operators for linear parabolic differential equations. In the estimation process, some a posteriori estimates for solutions of the linear ordinary differential equations play an essential role. By using these results, we present a verification condition for solutions of nonlinear problems. Some numerical examples will be presented.